

REMARKS

Claims 1-15 are pending in this application, with claims 9-11 and 15 being withdrawn from consideration.

Applicant appreciates the courtesies shown to Applicant's representative by Examiner Tentoni in the January 13, 2009 interview. Applicant's separate record of the substance of the interview is incorporated into the following remarks.

I. Rejections Relying Upon Pierini

Claims 1-4, 6, 7, 12 and 14 were rejected under 35 U.S.C. §102(b) as allegedly being anticipated by U.S. Patent No. 5,445,779 ("Pierini").

Claims 5 and 13 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Pierini in view of U.S. Patent No. 5,273,703 ("Alexander").

Claim 8 was rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Pierini in view of alleged admitted prior art.

Each of the above rejections is respectfully traversed.

The Patent Office alleges that Pierini describes a process of making a film from an aromatic heterocyclic polymer including the steps of forming a film, loading in the presence of a processing aid, and removing the processing aid and/or heat-treating the film. Applicant disagrees. Pierini does not describe "spinning in a coagulation medium a synthetic organic polymer to an aromatic heterocyclic rod fiber or obtaining the synthetic organic polymer as an aromatic heterocyclic rod film, followed by loading," as recited in the method of claim 1.

Pierini does not load/stretch after coagulation, but before. Pierini describes that polybenzazole dope can be cast onto a flat surface to form a film (col. 4, lines 17-41 of Pierini). This dope film is stretched at a temperature of, for example, 100 to 120°C (col. 5, lines 9-27 of Pierini). Pierini describes stretching, drying and heating the film (col. 5, line 38-

col. 6, line 21 of Pierini), then coagulating, washing and leaching the stretched film (col. 6, lines 24-54 of Pierini). The washed/leached film can be dried and adjusted by adding stress to the film (col. 6, line 56-col. 7, line 33 of Pierini).

Prior to coagulation occurring, there is only a dissolved polymer, also known as a dope or a polymer stream. Coagulation is performed to form a fiber or film as discussed above. Pierini describes that a "dope film" is stretched, indicating that the stretching occurs before coagulation, and in fact Pierini specifically describes that coagulation occurs after stretching (col. 6, lines 24-25 of Pierini). Thus, Pierini does not describe that loading or stretching occurs after coagulation has formed a rod fiber or rod film as required in claim 1.

In the Final Rejection, the Patent Office does not dispute that Pierini performs loading only after coagulation, but instead alleges that the present claims do not require this procedure for films. This is incorrect for several reasons.

First, although the Patent Office cites paragraph [0015] of the specification as relating only to coagulation of fibers, such is not the case. The second sentence of paragraph [0015] indicates that for either fibers or films, water or an aqueous solution is used as the coagulation medium and/or water or an aqueous solution is used for neutralization and washing. When an aromatic heterocyclic dope fiber or film is subjected to treatment with water or an aqueous solution as described in paragraph [0015], coagulation occurs due to removal of the solvent, because water is a well known nonsolvent/coagulant for aromatic heterocyclic materials. See, for example, Pierini at col. 6, lines 24-29 and 39-49, and U.S. Patent No. 5,302,334 (referenced in the above disclosure of Pierini) at col. 8, lines 24-32 (explaining that water is a nonsolvent, and thus a coagulant, for aromatic heterocyclic materials). The resulting dope is thus coagulated, which, as discussed above, is referred to as a rod film or rod fiber in the present claims.

Second, as was detailed in the prior response, claim 1 requires that loading be conducted on the rod film. A rod film, to be in rod film form, must first be coagulated. Coagulation is used to form the resultant rod film. Thus, in the process of claim 1, the rod film is required to have been subjected to loading after coagulation.

More particularly, the polymer in a solid film form can only be obtained by removing the solvent from a solution comprised of the aromatic heterocyclic polymer. Because the recited aromatic heterocyclic polymer has such a high melting point, the polymers only exist as solids when no longer dissolved in solvent. Coagulation, or solidifying of the polymer, occurs by removal of the solvent. When the solution is washed with a non-solvent such as water, the solvent is removed as explained above, leaving the polymer in a solid form. The form of the solid polymer obtained depends on how the solvent is removed. If removed during spinning, i.e., when the polymer is dissolved in a stream, a fiber results. If cast onto a surface when solvent removal is effected, a film results. Prior to solvent removal, the material is not a solid, and is only a dope, as in Pierini.

As a rod film in solid form can only be obtained by removal of the solvent as detailed above, it is clear that the rod film is coagulated. Reciting that that rod film is coagulated in claim 1 is unnecessary and duplicative as a rod film can only exist if coagulated.

Throughout the specification, it is made clear that fibers and films are described to be treated the same, the only difference being that the fibers are described to be "spun" and to include "filaments," terms that are not applicable to films because films are not spun and do not contain filaments. Otherwise, films and fibers are both described to be subjected to similar treatments, including coagulation via treatment with water or an aqueous solution as discussed above.

Accordingly, claim 1 requires that the rod films described therein first be coagulated prior to loading of the film. As Pierini admittedly does not describe such a process, Pierini clearly fails to anticipate any of the present claims.

For the foregoing reasons, withdrawal of the anticipation rejection relying upon Pierini is thus respectfully requested.

Neither Alexander nor the allegedly admitted prior art remedy the deficiencies of Pierini detailed above.

Regarding Alexander, this reference also does not describe "spinning in a coagulation medium a synthetic organic polymer to an aromatic heterocyclic rod fiber or obtaining the synthetic organic polymer as an aromatic heterocyclic rod film, followed by loading," as required in the method of claim 1. In addition, like Pierini, Alexander does not describe treating the coagulated as-spun fiber or the coagulated as-obtained film with a processing aid in the gas or vapor phase, between the loading step and the heating step as required in claims 5 and 13. Alexander describes that a polymer is dissolved in a solvent such as polyphosphoric acid, and then spun. After spinning, the fiber is coagulated and washed to remove polyphosphoric acid, and then dried. Heat treatment is then applied (col. 5, lines 33-56 of Alexander). From this description, it is apparent that Alexander uses steam for washing the residual acid, and not treating the as-spun fiber or the as-obtained film with a processing aid in the gas or vapor phase. Alexander also does not describe the use of a loading step.

Thus, Alexander does not describe a loading step, and therefore cannot describe treating the as-spun fiber or the as-obtained film with a processing aid in the gas or vapor phase, between the loading step and the heating step, as in claims 5 and 13.

Regarding the allegedly admitted prior art, the Patent Office again alleges that Applicant has admitted that PIPD fibers and films are known. However, PIPD fibers and

films with a high tensile strength and/or modulus obtained by the process of claim 1, as recited in claim 8, are not admitted prior art. Moreover, the alleged admitted prior art does not remedy the deficiencies of Pierini. Specifically, the alleged admitted prior art also does not describe "spinning in a coagulation medium a synthetic organic polymer to an aromatic heterocyclic rod fiber or obtaining the synthetic organic polymer as an aromatic heterocyclic rod film, followed by loading," as required in the method of claim 1.

For all the foregoing reasons, none of the claims are anticipated or rendered obvious by Pierini alone or Pierini together with Alexander or the allegedly admitted prior art. Withdrawal of the rejections is thus respectfully requested.

II. Rejoinder

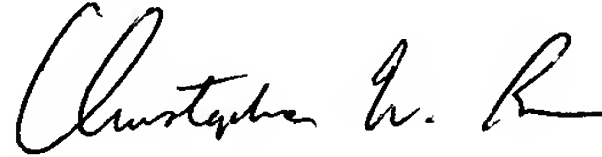
Each of withdrawn claims 9-11 and 15 is a dependent claim dependent from an elected claim. Accordingly, upon allowance of the elected claims, claims 9-11 and 15 should be rejoined with the application and similarly allowed.

III. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1-15 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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